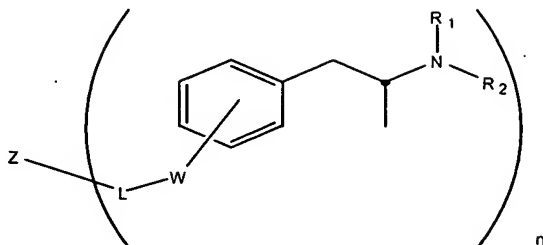


WHAT IS CLAIMED IS:

1. A compound of the formula:



5 wherein:

R^1 is H, lower alkyl, a protecting group,

R^2 is H, lower alkyl, a protecting group,

L is a bond or a linking group,

W is a heteroatom,

10 Z is H, a protecting group, a poly(amino acid), a non-poly(amino acid) label moiety, a non-poly(amino acid) immunogenic carrier, or a functional group excluding thiol,

n is 1 when Z is other than a poly(amino acid) or, when Z is a poly(amino acid), n is an integer between 1 and the molecular weight of the poly(amino acid) divided by about 500;

15 and salts thereof.

2. A compound according to Claim 1 wherein R^1 is H and R^2 is H.

3. A compound according to Claim 1 wherein R^1 is H and R^2 is lower alkyl.

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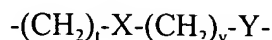
4. A compound according to Claim 3 wherein lower alkyl is methyl.

5. A compound according to Claim 1 wherein Z is a poly(amino acid).

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6. A compound according to Claim 5 wherein said poly(amino acid) is an enzyme or an immunogenic protein.

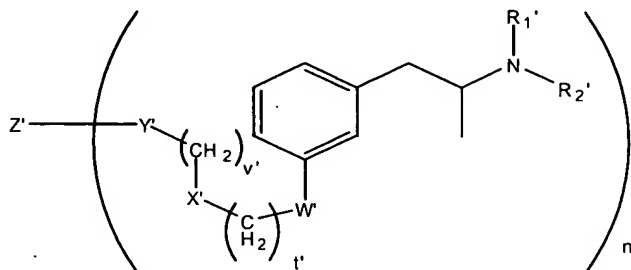
7. A compound according to Claim 1 wherein L is



wherein X is C(O) or SO₂, Y is a bond, S or -NR³ wherein R³ is H or lower alkyl, W is O, S, or NH, and t is an integer from 1 to 6 and v is an integer from 0 to 6.

5

8. A compound of the formula:



wherein:

R^{1'} is H, lower alkyl, a protecting group,

10 R^{2'} is H, lower alkyl, a protecting group,

W' is O, S or NR³ wherein R³ is H or lower alkyl,

X' is C(O) or SO₂,

Y' is bond, S or -NR³ wherein R³ is H or lower alkyl,

15 Z' is H, a protecting group, a poly(amino acid), a non-poly(amino acid) label moiety, a non-poly(amino acid) immunogenic carrier, or a functional group,

t' is an integer from 1 to 6 and v' is an integer from 0 to 6,

n' is 1 when Z' is other than a poly(amino acid) or, when Z' is a poly(amino acid), n' is an integer between 1 and the molecular weight of the poly(amino acid) divided by about 500;

20 and salts thereof.

9. A compound according to Claim 8 wherein R^{1'} is H and R^{2'} is H.

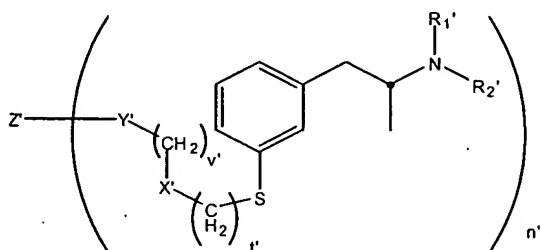
10. A compound according to Claim 8 wherein R^{1'} is H and R^{2'} is methyl.

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11. A compound according to Claim 8 wherein Z' is a poly(amino acid).

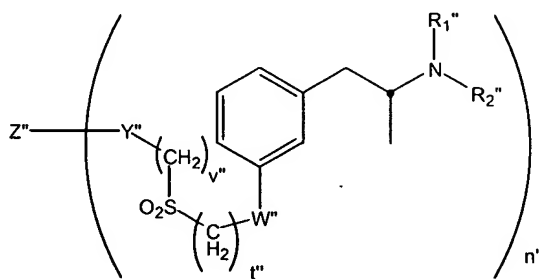
12. A compound according to Claim 8, which is stereoisomer.

13. A compound according to Claim 12 wherein said stereoisomer has the formula:



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14. A compound of the formula:

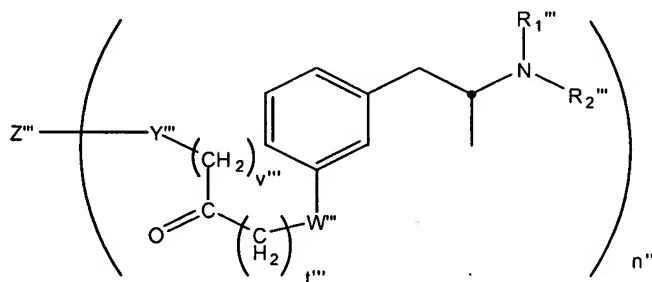


wherein:

- 10 $R^{1''}$ is H, lower alkyl, a protecting group,
 $R^{2''}$ is H, lower alkyl, a protecting group,
 W'' is O, S, or $NR^{3''}$ wherein $R^{3''}$ is H or lower alkyl,
 Y'' is bond, S or $-NR^{3''}$ wherein $R^{3''}$ is H or lower alkyl,
 Z'' is H, a protecting group, a poly(amino acid), a non-poly(amino acid) label
15 moiety, a non-poly(amino acid) immunogenic carrier, or a functional group,
 t'' is an integer from 1 to 6 and v'' is an integer from 2 to 6,
 n'' is 1 when Z'' is other than a poly(amino acid) or, when Z'' is a poly(amino acid),
 n'' is an integer between 1 and the molecular weight of the poly(amino acid) divided by
about 500;
20 and salts thereof.

15. A compound according to Claim 14 wherein $R^{1''}$ is H and $R^{2''}$ is H.

16. A compound according to Claim 14 wherein $R^{1''}$ is H and $R^{2''}$ is methyl.
17. A compound according to Claim 14 wherein Z'' is an enzyme.
- 5 18. A compound according to Claim 17 wherein said enzyme is glucose-6-phosphate dehydrogenase.
19. A compound according to Claim 14 wherein Z'' is an immunogenic protein or a non-poly(amino acid) immunogenic carrier.
- 10 20. An antibody raised against a compound according to Claim 19.
21. A reagent system comprising a compound according to Claim 17, an antibody for amphetamine and/or an antibody for methamphetamine.
- 15 22. A reagent system comprising an antibody according to Claim 20 and an enzyme conjugate of an amphetamine and/or an enzyme conjugate of methamphetamine.
23. A compound of the formula:



wherein:

- $R^{1''}$ is H, lower alkyl, a protecting group,
- $R^{2''}$ is H, lower alkyl, a protecting group,
- W'' is O, S, or $NR^{3''}$ wherein $R^{3''}$ is H or lower alkyl,
- 25 Y''' is a bond, S or $-NR^{3''}$ wherein $R^{3''}$ is H or lower alkyl,

Z''' is H, a protecting group, a poly(amino acid), a non-poly(amino acid) label moiety, a non-poly(amino acid) immunogenic carrier, or a functional group,

t''' is an integer from 1 to 6 and v''' is an integer from 0 to 6,

n''' is 1 when Z''' is other than a poly(amino acid) or, when Z''' is a poly(amino acid), n''' is an integer between 1 and the molecular weight of the poly(amino acid) divided by about 500;
and salts thereof.

24. A compound according to Claim 23 wherein R^{1'''} is H and R^{2'''} is H.
25. A compound according to Claim 23 wherein R^{1'''} is H and R^{2'''} is methyl.
26. A compound according to Claim 23 wherein Z''' is an enzyme.
27. A compound according to Claim 26 wherein said enzyme is glucose-6-phosphate dehydrogenase.
28. A compound according to Claim 23 wherein Z''' is an antigen or a non-poly(amino acid) immunogenic carrier.
29. An antibody raised against a compound according to Claim 28.
30. A reagent system comprising a compound according to Claim 26, an antibody for amphetamine and/or an antibody for methamphetamine.
31. A reagent system comprising an antibody according to Claim 29 and an enzyme conjugate of an amphetamine and/or an enzyme conjugate of methamphetamine.
32. A method for determining amphetamine and/or methamphetamine in a sample suspected of containing amphetamine and/or methamphetamine, said method comprising:

- (a) providing in combination in a medium:
 - (i) said sample and
 - (ii) a reagent system according to Claim 21; and
- (b) examining said medium for the presence of a complex comprising said
5 amphetamine and said antibody for amphetamine and/or a complex of said
methamphetamine and said antibody for methamphetamine, the presence thereof indicating
the presence of said amphetamine and/or methamphetamine in said sample.

33. A method according to Claim 32 wherein said examining comprises
10 measuring signal from said enzyme, the amount thereof being related to the presence of said
amphetamine and/or methamphetamine in said sample.

34. A method according to Claim 33 wherein said method is a homogeneous
method and said medium is examined for the amount of said signal.

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35. A method according to Claim 33 wherein said method is a heterogeneous
method and said complex, if present, is separated from said medium and said medium or
said complex is examined for the amount of said signal.

20 36. A method for determining amphetamine and/or methamphetamine in a
sample suspected of containing amphetamine and/or methamphetamine, said method
comprising:

- (a) providing in combination in a medium:
 - (i) said sample and
 - (ii) a reagent system according to Claim 22; and
- (b) examining said medium for the presence of a complex comprising said
25 amphetamine and said antibody for amphetamine and/or a complex of said
methamphetamine and said antibody for methamphetamine, the presence thereof indicating
the presence of said amphetamine and/or methamphetamine in said sample.

37. A method according to Claim 36 wherein said examining comprises measuring signal from said enzyme, the amount thereof being related to the presence of said amphetamine and/or methamphetamine in said sample.

5 38. A method according to Claim 37 wherein said method is a homogeneous method and said medium is examined for the amount of said signal.

39. A method according to Claim 37 wherein said method is a heterogeneous method and said complex, if present, is separated from said medium and said medium or
10 said complex is examined for the amount of said signal.

40. A method for determining amphetamine and/or methamphetamine in a sample suspected of containing amphetamine and/or methamphetamine, said method comprising:

15 (a) providing in combination in a medium:
 (i) said sample and
 (ii) a reagent system according to Claim 30; and
 (b) examining said medium for the presence of a complex comprising said
 amphetamine and said antibody for amphetamine and/or a complex of said
20 methamphetamine and said antibody for methamphetamine, the presence thereof indicating
 the presence of said amphetamine and/or methamphetamine in said sample.

41. A method according to Claim 40 wherein said examining comprises measuring signal from said enzyme, the amount thereof being related to the presence of said
25 amphetamine and/or methamphetamine in said sample.

42. A method according to Claim 41 wherein said method is a homogeneous method and said medium is examined for the amount of said signal.

30 43. A method according to Claim 41 wherein said method is a heterogeneous

method and said complex, if present, is separated from said medium and said medium or said complex is examined for the amount of said signal.

5 44. A method for determining amphetamine and/or methamphetamine in a sample suspected of containing amphetamine and/or methamphetamine, said method comprising:

 (a) providing in combination in a medium:

 (i) said sample and

 (ii) a reagent system according to Claim 31; and

10 (b) examining said medium for the presence of a complex comprising said amphetamine and said antibody for amphetamine and/or a complex of said methamphetamine and said antibody for methamphetamine, the presence thereof indicating the presence of said amphetamine and/or methamphetamine in said sample.

15 45. A method according to Claim 44 wherein said examining comprises measuring signal from said enzyme, the amount thereof being related to the presence of said amphetamine and/or methamphetamine in said sample.

20 46. A method according to Claim 45 wherein said method is a homogeneous method and said medium is examined for the amount of said signal.

25 47. A method according to Claim 45 wherein said method is a heterogeneous method and said complex, if present, is separated from said medium and said medium or said complex is examined for the amount of said signal.

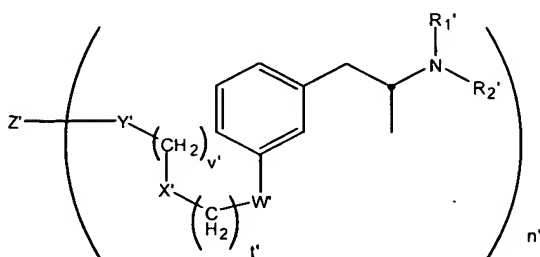
 48. A method for determining amphetamine and/or methamphetamine in a sample suspected of containing amphetamine and/or methamphetamine, said method comprising:

 (a) providing in combination in a medium:

30 (i) said sample,

 (ii) an antibody for amphetamine,

- (iii) an antibody for methamphetamine,
- (iv) a compound of the formula:



wherein:

- 5 R^{1'} is H, lower alkyl, a protecting group,
R^{2'} is H, lower alkyl, a protecting group,
W' is O, S, or NR^{3'} wherein R^{3'} is H or lower alkyl,
X' is C(O) or SO₂,
Y' is bond, S or -NR^{3'} wherein R^{3'} is H or lower alkyl,
10 Z' is an enzyme,
t' is an integer from 1 to 6 and v' is an integer from 0 to 6,
n' is an integer between 1 and the molecular weight of said enzyme divided by about
500; and

- (b) examining said medium for the presence of a complex comprising said
15 amphetamine and said antibody for amphetamine and/or a complex of said
methamphetamine and said antibody for methamphetamine, the presence thereof indicating
the presence of said amphetamine and/or methamphetamine in said sample.

49. A method according to Claim 48 wherein said examining comprises
20 measuring signal from said enzyme, the amount thereof being related to the presence of said
amphetamine and/or methamphetamine in said sample.

50. A method according to Claim 49 wherein said method is a homogeneous method and said medium is examined for the amount of said signal.

- 25
51. A method according to Claim 49 wherein said method is a heterogeneous method and said complex, if present, is separated from said medium and said medium or

said complex is examined for the amount of said signal.

52. A method according to Claim 48 wherein said enzyme is glucose-6-phosphate dehydrogenase.

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53. A method for determining amphetamine and/or methamphetamine in a sample suspected of containing amphetamine and/or methamphetamine, said method comprising:

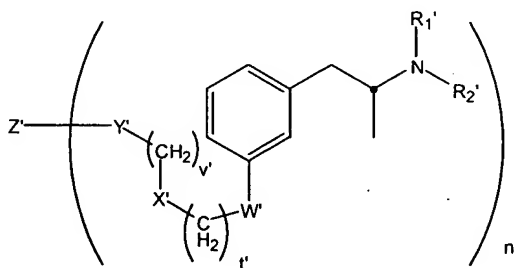
(a) providing in combination in a medium:

10

(i) said sample,

(ii) a conjugate of an enzyme and an amphetamine analog and/or a conjugate of an enzyme and a methamphetamine analog,

(iii) an antibody for amphetamine, said antibody being raised against a compound of the formula:



15

wherein:

$R^{1'}$ is H and $R^{2'}$ is H,

W' is O, S, or $NR^{3'}$, wherein $R^{3'}$ is H or lower alkyl,

X' is $C(O)$ or SO_2 ,

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Y' is bond, S or $-NR^{3'}$, wherein $R^{3'}$ is H or lower alkyl,

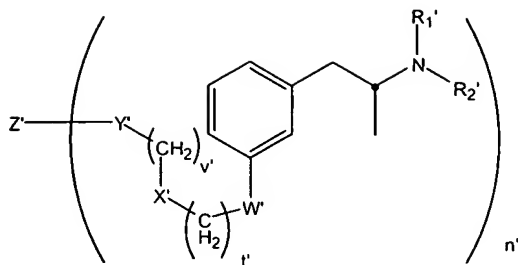
Z' is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

t' is an integer from 1 to 6 and v' is an integer from 0 to 6,

n' is an integer between 1 and the molecular weight of said antigen or said immunogenic carrier divided by about 500; and/or

25

(iv) an antibody for methamphetamine, said antibody being raised against a compound of the formula:



wherein:

$R^{1'}$ is H and $R^{2'}$ is methyl,

W' is O, S, or $NR^{3'}$ wherein $R^{3'}$ is H or lower alkyl,

5 X' is $C(O)$ or SO_2 ,

Y' is bond, S or $-NR^{3'}$ wherein $R^{3'}$ is H or lower alkyl,

Z' is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

t' is an integer from 1 to 6 and v' is an integer from 0 to 6,

10 n' is an integer between 1 and the molecular weight of said antigen or said immunogenic carrier divided by about 500; and

(b) examining said medium for the presence of a complex comprising said amphetamine and said antibody for amphetamine and/or a complex of said methamphetamine and said antibody for methamphetamine, the presence thereof indicating the presence of said amphetamine and/or methamphetamine in said sample.

15

54. A method according to Claim 53 wherein said examining comprises measuring signal from said enzyme, the amount thereof being related to the presence of said amphetamine and/or methamphetamine in said sample.

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55. A method according to Claim 54 wherein said method is a homogeneous method and said medium is examined for the amount of said signal.

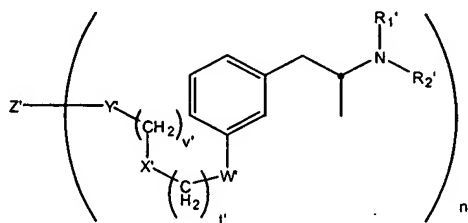
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56. A method according to Claim 54 wherein said method is a heterogeneous method and said complex, if present, is separated from said medium and said medium or said complex is examined for the amount of said signal.

57. A method according to Claim 53 wherein said enzyme is glucose-6-phosphate dehydrogenase.

58. A kit comprising in packaged combination:

- 5 (i) an antibody for amphetamine,
 (ii) an antibody for methamphetamine,
 (iii) a compound of the formula:



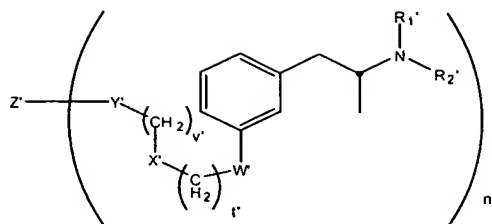
wherein:

- 10 $R^{1'}$ is H, lower alkyl, a protecting group,
 $R^{2'}$ is H, lower alkyl, a protecting group,
 W' is O, S, or $NR^{3'}$ wherein $R^{3'}$ is H or lower alkyl,
 X' is $C(O)$ or SO_2 ,
 Y' is bond, S or $-NR^{3'}$ wherein $R^{3'}$ is H or lower alkyl,
 15 Z' is an enzyme,
 t' is an integer from 1 to 6 and v' is an integer from 0 to 6,
 n' is an integer between 1 and the molecular weight of said enzyme divided by about 500.

20 59. A kit according to Claim 58 wherein said enzyme is glucose-6-phosphate dehydrogenase.

60. A kit comprising in packaged combination:

- 25 (i) a conjugate of an enzyme and an amphetamine analog and/or
 a conjugate of an enzyme and a methamphetamine analog,
 (ii) an antibody for amphetamine, said antibody being raised
 against a compound of the formula:



wherein:

$R^{1'}$ is H and $R^{2'}$ is H,

W' is O, S, or $NR^{3'}$ wherein $R^{3'}$ is H or lower alkyl,

5 X' is $C(O)$ or SO_2 ,

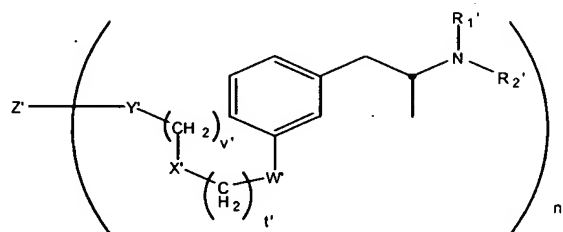
Y' is bond, S or $-NR^{3'}$ wherein $R^{3'}$ is H or lower alkyl,

Z' is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

t' is an integer from 1 to 6 and v' is an integer from 0 to 6,

10 n' is an integer between 1 and the molecular weight of said antigen or said immunogenic carrier divided by about 500; and/or

(iii) an antibody for methamphetamine, said antibody being raised against a compound of the formula:



wherein:

15 $R^{1'}$ is H and $R^{2'}$ is methyl,

W'' is O, S, or $NR^{3'}$ wherein $R^{3'}$ is H or lower alkyl,

X' is $C(O)$ or SO_2 ,

Y' is bond, S or $-NR^{3'}$ wherein $R^{3'}$ is H or lower alkyl,

Z' is an immunogenic protein or a non-poly(amino acid) immunogenic carrier,

20 t' is an integer from 1 to 6 and v' is an integer from 0 to 6,

n' is an integer between 1 and the molecular weight of said antigen or said immunogenic carrier divided by about 500.

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